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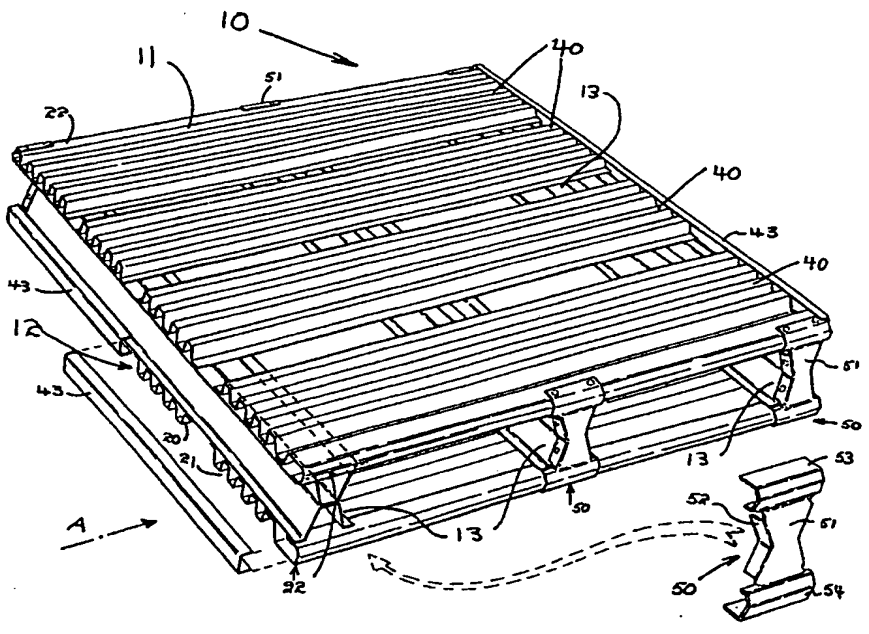
(54) Title: MATERIAL HANDLING PALLET



(57) Abstract

A steel material handling pallet (10) has a deck (11) of corrugated planks (40) and a base (12) of corrugated portions (20, 21) welded to bearers (13). Each bearer (13) consists of a pair of U-shaped channels (30, 31) each having a web portion (32) and sloping legs (33, 34). The angle between legs (33, 34) and the webs (32) is between 90° and 120° to provide optimum strength in respect of uniformly distributed loads, bending loads and shear loads.

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MATERIAL HANDLING PALLET

FIELD OF INVENTION

This invention relates to pallets of the kind used for transport of a wide variety of goods and commodities.

BACKGROUND ART

Wooden pallets are widely used but suffer from several disadvantages not the least of which is that they are easily damaged. Furthermore, wooden pallets readily absorb moisture which leads to increased weight and often to degradation of the timber.

Various metal pallets have been proposed but none has achieved commercial success, mainly because of the bulk of the metal pallet and/or its cost.

It is, therefore, an object of this invention to provide an improved pallet which is so designed that it may be constructed of lightweight material without sacrifice of its load carrying capacity.

DISCLOSURE OF THE INVENTION

According to the invention there is provided a pallet comprising a deck, a base, and a plurality of bearers therebetween, characterised in that each bearer is of an H-shape having upper and lower pairs of leg portions above and below an intermediate web, said leg portions being inclined at an oblique angle to the intermediate web, and said upper legs of each bearer being connected to the deck and the lower legs of each bearer being connected to the base.

The invention also provides a pallet comprising a deck,

a base and a plurality of bearers therebetween characterised in that each bearer consists of a pair of U-shaped channels each having a web portion, sloping leg portions each at an oblique angle to the web portion and outwardly directed flanges at the free end of the leg portions, said channels being connected together at their web portions with the flanges of one channel being connected to the deck and the flanges of the other channel being connected to the base.

Preferably, each bearer is formed by welding two channel members together by their webs with the open face of each channel being outwardly directed. The outwardly directed flanges at the free end of the legs of the upper channel are welded to the pallet deck and the flanges of the lower channel are welded to the pallet base.

DESCRIPTION OF DRAWINGS

In order that the invention may be more readily understood and put into practical effect reference will now be made to the accompaying drawings in which:

Fig. 1 is a perspective view of a pallet according to one embodiment of the invention,

Fig. 2 is a partially broken away end view of the pallet shown in Fig. 1, taken in the direction of arrow A,

Fig. 3 is an enlarged end view of a plank of the deck of the pallet shown in Fig. 1,

Fig. 4 is an enlarged end view of a bearer of the pallet shown in Fig. 1,

Fig. 5 is an end view of an alternative side channel for the pallet shown in Fig. 1, and,

Fig. 6 is an end view of a protection cap for the pallet shown in Fig 1,

DESCRIPTION OF PREFERRED EMBODIMENT

The pallet 10 shown in the drawings has a load-supporting deck 11, a base 12 and three bearers 13 connected between the deck 11 and the base 12. The deck 11 has four planks 40 which are formed from a light gauge, high strength steel sheet which is pressed into the corrugated shape shown in Fig. 3. In this instance, the pitch (P) of each corrugation is 75mm and the height of each corregation is approximately 23mm. However, the corrugation pitch (P) can be varied as desired to accommodate variations in pallet size. The deck 11 could be of any desired shape of configuration. For example, there could be more or less planks 40 closer together or further apart, or the deck 11 could be continuous.

As shown in Fig. 3, the plank 40 has top webs 14 and bottom webs 16 interconnected by leg portions 15. Although the top web 14 of the plank 40 is shown as being horizontal it may, of course be curved.

As indicated in Fig. 1, the base 12 consists of a central corrugated plank 20 and two side planks 21. Side channels 22 are fitted along the outer extremities of the outer planks 40 of the deck 11 and the side portions 21 of the base 12. As can been seen in Fig. 2, each side channel 22 has a flange 41 by means of which the channel 22 is welded to the bearers 13. The channels 22 have a bull-nose portion 43 at their extremities as shown in Fig. 2. A side strip 43 may be fitted over the ends of the planks of the deck and the portions 20, 21 of the base 12 as indicated in Fig. 1

An enlarged view of the bearer 13 is shown in Fig. 4. In this instance, the bearer 13 consists of an upper channel 30 and a lower channel 31 which are welded together at their webs 32 with the open mouth of each channel extending outwardly. Each channel 30, 31 has sloping leg portions 33, 34 at an oblique angle (W) to the webs 32. At the free end of the leg portions 33, 34 there are outwardly directed flanges 35 by means of which the bearer 13 is welded to the deck 11 and to the base 12. As indicated in Fig. 4, the width of each flange 35 is approximately half that of the web 32. In one embodiment of the invention the web 32 is effectively 27mm wide, the leg portions 33, 34 effectively 47mm wide and the flanges 35 effectively 15mm wide.

The choice of the angle (W) of the leg portions 33, 34 the web is a compromise between the optimum angle for each of the loads to which a pallet may be subjected. In the case of a load uniformly distributed across the deck 11, the optimum angle (W) is zero - that is the leg portions 33, 34 should be vertical. In the case of bending arising from point loads applied between the bearers 13, the optimum angle (W) is zero, however, the width of the web 32 is somewhat critical. In the case of shear (ie: a load is applied along the deck 11 and along the base 12, but in opposite directions, the optimum angle (W) is 30^{o}.

Taking all these factors into account, and preferred angle (W) is 15^{o}, however, angles between zero and 30^{o} will suffice in certain circumstances. Thus, the angle between the leg portions and the intermediate web may be from 90^{o} to 120^{o} with 105^{o} being preferred.

The side channel shown in Fig. 5 is substantially similar to that shown in Fig. 2 except that the bull-nose 42a has an arcuate configuration.

An advantage of the construction of a pallet according the invention is that the pallet may be adapted to conform

to relevant Standards. Furthermore, the optimum choice of the angle between the leg and the web of each channel of the bearer and the choice of an appropriate high strength material leads to a pallet of unique lightness and strength.

Various modifications may be made in details of design and construction without departing from the scope and ambit of the invention. For example, a closure plate 50 may be welded across the ends of each bearer 13 as shown in Fig 1 The closure plate 50 has a central portion 51 having side flanges 52 that are welded to the leg portions 33, 34 of the bearers 13. End caps 53, 54 engage over and are welded to the side channels 27 of the deck 11 and base 12.

CLAIMS

1. A material handling pallet comprising a deck, a base, and a plurality of bearers therebetween, characterised in that each bearer is of an H-shape having upper and lower pairs of leg portions above and below an intermediate web, said leg portions being inclinded at an oblique angle to the intermediate web, and said upper legs of each bearer being connected to the deck and the lower legs of each bearer being connected to the base.

2. A material handling pallet comprising a deck, a base and a plurality of bearers therebetween characterised in that each bearer consists of a pair of U-shaped channels each having a web portion, sloping leg portions each at an oblique angle to the web portion and outwardly directed flanges at the free end of the leg portions, said channels being connected together at their web portions with the flanges of one channel being connected to the deck and the flanges of the other channel being connected to the base.

3. A material handling pallet according to claim 1 wherein each bearer is formed by welding two channel members together by their webs with the open face of each channel being outwardly directed.

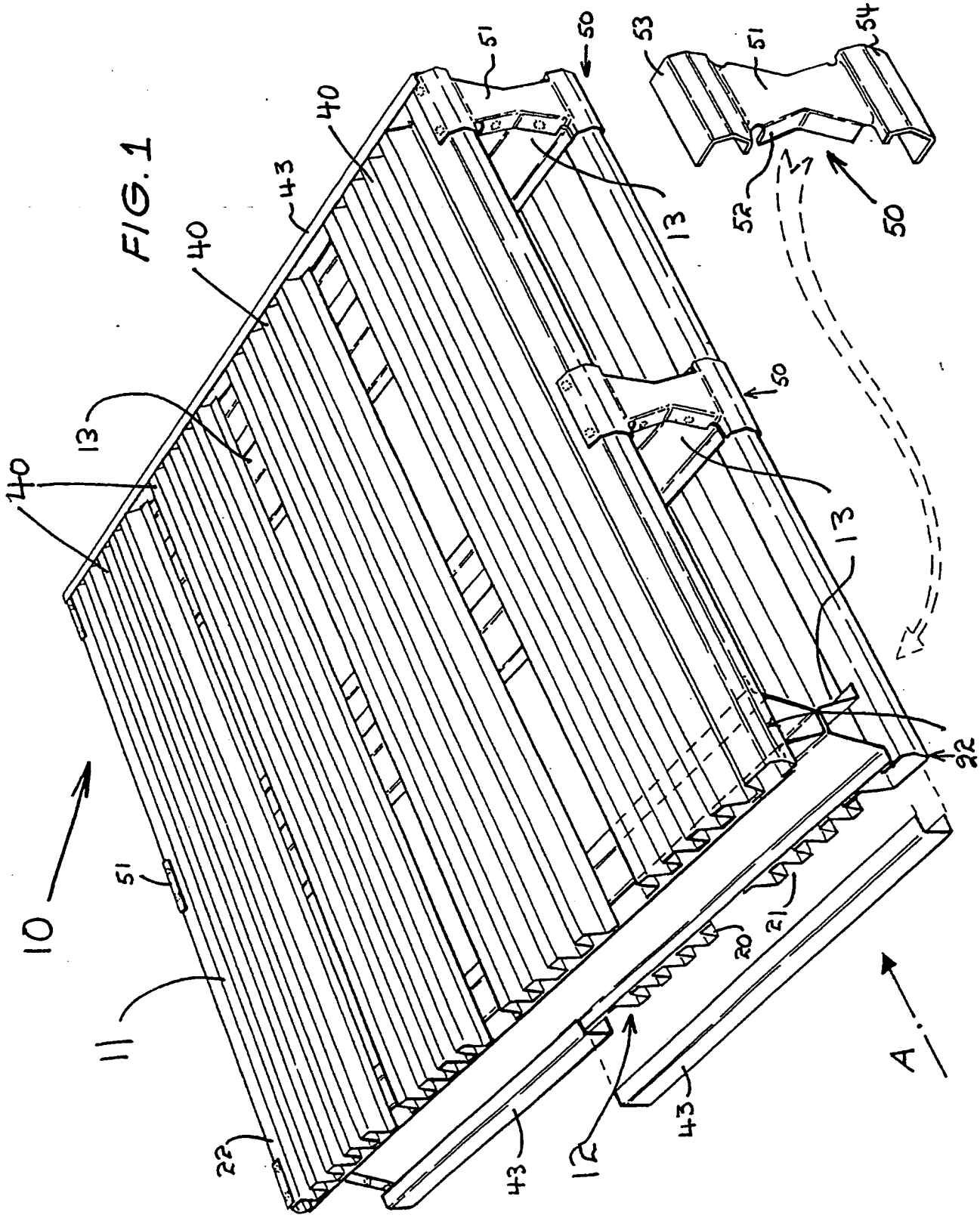
4. A material handling pallet according to claim 3 wherein the channel members have outwardly directed flanges at the free end of their legs and the outwardly directed flanges at the free end of the legs of the upper channel are welded to the pallet deck and the flanges of the lower channel are welded to the pallet base.

5. A material handling pallet according to claim 1 wherein the angle between the leg portions and the intermediate web is from 90` to 120`.

6. A material handling pallet according to claim 1 where the angle between each leg portion and the intermediate web is 105`.

7. A material handling pallet according to claim 3 wherein closure plates are secured to the end of the bearers.

FIG. 1



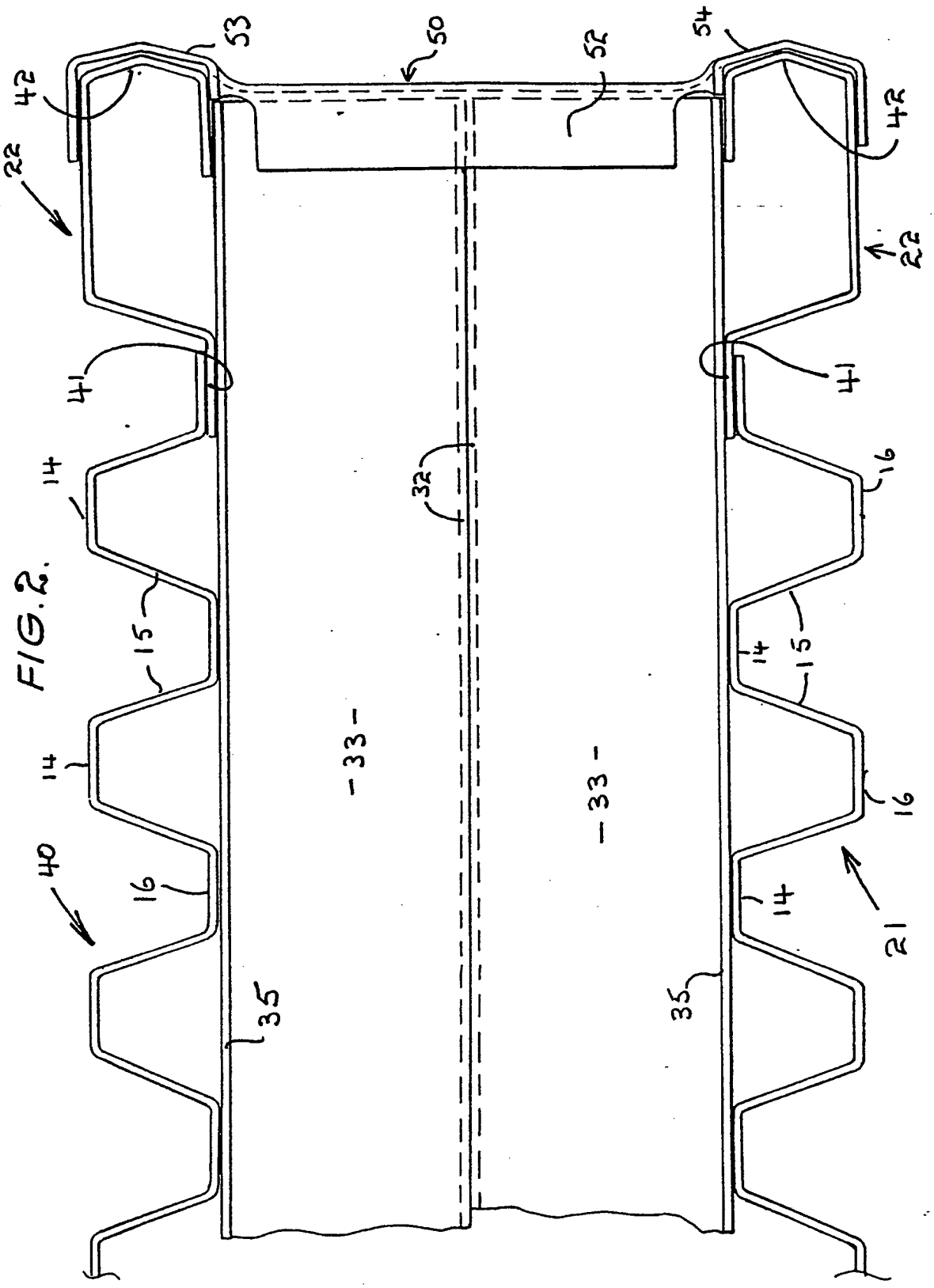

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FIG. 2.

FIG. 3

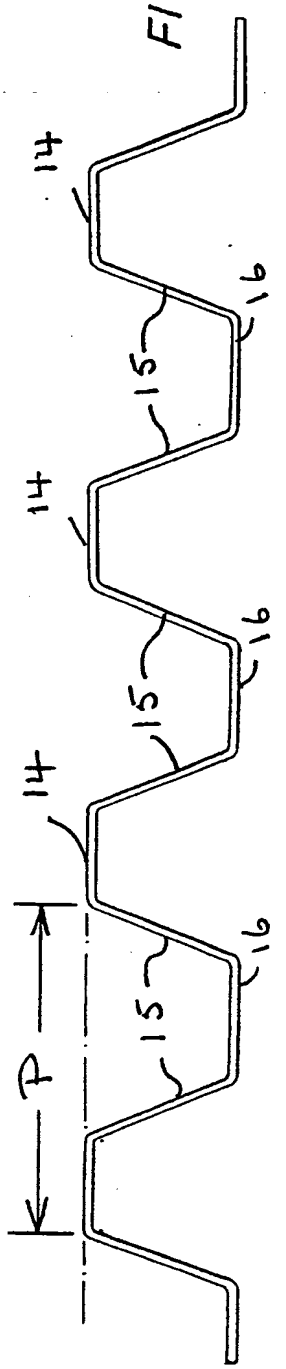


FIG. 6.

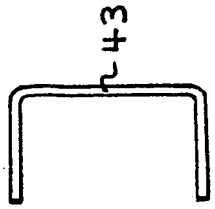


FIG. 5

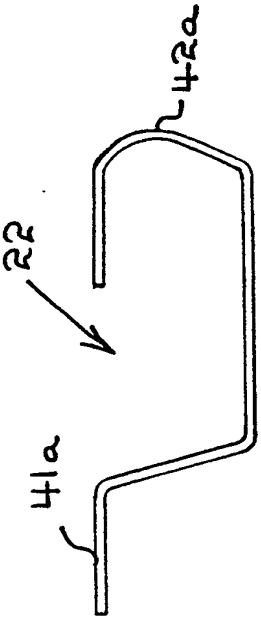
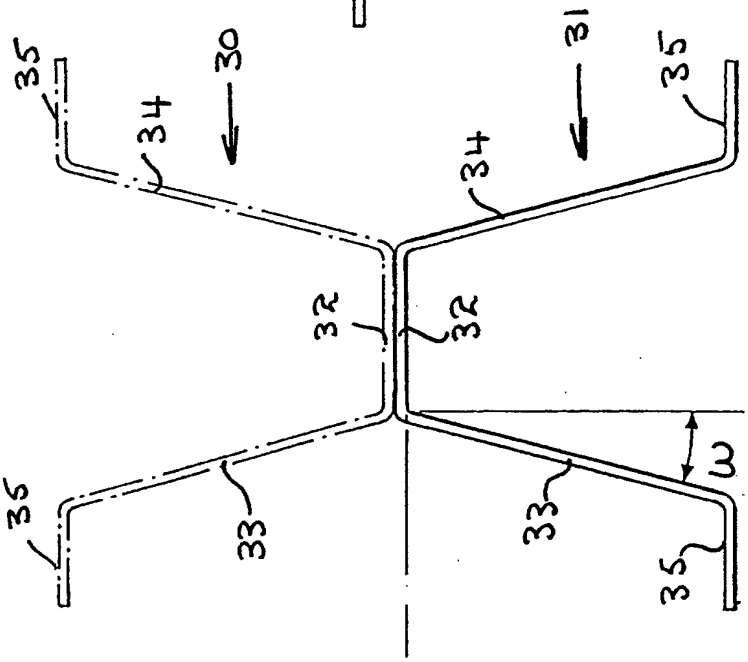


FIG. 4



INTERNATIONAL SEARCH REPORT

International Application No PCT/AU 85/00159

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl.[4] B65D 19/28

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC	B65D 19/28
US Cl	108/52.1, 108/57.1, 108/901

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

AU: IPC as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
X	AU, A, 10693/47 (FORKTRUCKS PALLETS LTD) 14 Sept. 1948 (14.08.48)	(1-7)
A	US, A, 2699912 (CUSHMAN, WW) 18 Jan 1955 (18.01.55)	(1-5)
A	AU, A, 48122/79 (EXTRADOS CO. LTD) 3 Jan 1980 (03.01.80)	(1-5)

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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
17 September 1985 (17.09.85)	(25-09-85) 25 SEPTEMBER 1985
International Searching Authority	**Signature of Authorized Officer**
AUSTRALIAN PATENT OFFICE	R. KIRBY

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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON
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This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Members		
AU 48122/79	BR 7903870	CA 1121287	CA 1141683
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	NZ 190748	US 4382414	DE 2915460
	IN 152710	JP 54142801	ZA 793013

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